

Mineral Processing Experimental Proposal Report Guide

MINE 3544: MINERAL PROCESSING LABORATORY

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Overview

The following guide describes the required formatting, contents, and organization of the Experimental Proposal written report, which is part of the course term project. Please familiarize yourself with the formatting and content requires for this report.

Recommended Template

The following sections will be included in the Experimental Proposal Report. A description of each major section follows. In the report, each major section should begin on a new page.

Cover Page

1. Introduction & Objectives

- 1.1. Background
- 1.2. Motivation/Preliminary Data
- 1.3. Objectives & Hypothesis

2. Technical Approach

- 2.1. Material Samples
- 2.2. Sample Preparation and Characterization
- 2.3. Experimental Protocols/Experimental Design
- 2.4. Data Analysis

3. Resources and Timeline

- 3.1. Required Equipment and Facilities
- 3.2. Timeline/Gantt Chart

4. References (if any)

Section Descriptions

1. Introduction & Objectives

a. Purpose

This section should describe the technical merit of the proposed work. It needs to explain any relevant background information and then use that background information to provide a motivation for the proposed work. This motivation sub-section is usually an ideal place to incorporate prior data from some of the prior lab exercises. For example, one of the older exercises may have provided some indication of an interesting phenomena that you are now wanting to explore further.

Ultimately, the critical component of this section (and the entire report) is the project objective statement. The objective statement is clear and concise description of the overall purpose of the work. It is usually phrased as single sentence (when the work has a single objective) or as a bulleted list when the work has multiple objectives. The language and sentence structure used to introduce the project objective should be direct and precise (e.g. “The primary objective of this work is to…”). Typically, the objective statement occurs in the middle or latter part of Introduction & Objectives section. The preceding paragraphs explain why the objective is important, while the proceeding paragraphs explain your expectation or hypothesis concerning the objective.

b. Rhetorical and Stylistic Elements

Knowing your audience and objectives will inform your technical writing style. Important considerations for Introductions are logical organization of paragraphs (i.e. topics), explicit signal phrases, correct tenses (general facts and trends vs. proposed actions), and the impact of active and passive voice on the subject. Sentences should be concise and direct and use concrete, precise terms.

c. Recommended Length

This section should be concise: 1 to 1.5 pages is sufficient.

d. Recommended Graphics and other Elements

This section is usually driven by text rather than graphics; however, some preliminary data could be included as a graph or table.

e. Key Question Answered

Why is the proposed work significant?

2. Technical Approach

a. Purpose

This section should clearly articulate the work that must be performed to achieve the project objective. In many professional bids, this section may also be called a “Statement of Work” or a “Scope of Work.” Key information should include: the material that will be used for testing, the preparation or characterization that must be performed prior to testing, the experimental protocols that will be used, the experimental parameters that will be evaluated, and the procedures that will be used to analyze the data and interpret the results. The experimental design should clearly state which test parameters will be held constant and which will be varied between experimental runs. Furthermore, this section must carefully balance the use of detail. The descriptions should of sufficient detail so that the reader has no question on

how the work will be completed; however, the text should also avoid providing too much detail on trivial matters. Knowledge of the audience is critical to balancing detail. However, the writer should clearly explain what parameters will be tested, particularly those that will influence experimental results.

The writer needs to list each step of the experiment, with enough detail to perform that step, but not too much so that would make the laboratory technician distracted, or think completion of the experiment is not possible. Table 1 provides an example of these two cases. In addition you will need to list what data the contractor should document including what pictures to take, assays, and material masses.

Table 1. Comparison of Level of Detail needed in this Experimental Proposal

Too much trivial detail...	Appropriate description of experimental design...
<p>Step 1. Weigh 500 grams of a representative sample of chalcopyrite ore using a calibrated balance with a precision of ± 0.05 mg.</p> <p>Step 2. Measure 1.75 liters of Blacksburg tap water using a graduated cylinder.</p> <p>Step 3. Mix ore and water in a 3 liter stainless steel vessel for no less than 3 minutes or until thoroughly homogenized.</p>	<p>Step 1. Weigh 500 grams of chalcopyrite. Ensure a representative sample is obtained by scooping up the pile.</p> <p>Step 2. Mix ore and 1.75 L of water in a 3 liter stainless steel vessel until thoroughly homogenized.</p>

b. Rhetorical and Stylistic Elements

Logical organization and blocking of information is critical for this section. Topics should be broken down and presented to the reader in manageable chunks. Avoid shotgun blast descriptions. Keep descriptions of materials, equipment or processes distinct from one another. While a proposal will rely heavily on future tenses (*will*), descriptions of theory, scientific truths, equipment or materials are still presented in present tense—*they have not changed; this is what they are*. Other important stylistic considerations are the use of strong signal phrases and transitions. Again, sentences should strive for directness and the language should be precise and concrete. Visuals should be logically integrated into report body and called out from the text.

c. Recommended Length

This section should comprise the majority of the proposal. Usually 2 to 3 pages of text, plus figures will be needed.

d. Recommended Graphics and other Elements

Graphics can and should be used to enhance the discussion and provide clarity and conciseness for key points. Examples include but are not limited to: a flowsheet showing the experimental steps, a table outlining the experimental design or critical experimental parameters, equations showing how the data analysis will be conducted, etc.

e. Key Question Answered

How will the experimental work be conducted?

3. Resources and Timeline

a. Purpose

This section describes the equipment and other resources (including human resources) needed to complete the proposed work. In an industrial bid, this section would often include a cost proposal that aligns the resource requirement with the proposed effort. This section should describe the supplies, equipment, and reagents that will be used during testing. Furthermore, this section should include a small calendar or Gantt chart showing when key elements of the project will be completed. Items to include in the calendar include: time for the lab to complete experiments, data analysis and figure generation, writing and technical conferences with the course instructor, and final report preparation. Students should carefully consider how much time will be needed to complete each task and integrate this knowledge into the planned timeline.

b. Rhetorical and Stylistic Elements

Again, logical organization and blocking of information is important for this section. Topics should be broken down logically and presented to the reader in manageable chunks. Paragraphs should try to stay focused on developing a single topic. Proposals make frequent use of future tenses (*will*); however, descriptions of machines or materials are still presented in the present tense—they have not changed; *this is what they are*. Other important stylistic considerations are the use of strong signal phrases and transitions. Sentences should strive for directness, and language should be precise and concrete. Visuals should be logically integrated into the prose and called out from the text.

c. Recommended Length

The text in this section should be very concise, 0.5 pages is likely sufficient.

d. Recommended Graphics and other Elements

A calendar showing the proposed timeline must be included in this section.

e. Key Questions Answered

What resources are needed to complete the proposed work?